
Does hybridisation with White-cheeked Turaco *Tauraco leucotis* represent a threat for Prince Ruspoli's Turaco *T. ruspolii*?

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L'hybridation avec le Touraco à joues blanches *Tauraco leucotis* représente-t-elle une menace pour le Touraco du Prince Ruspoli *T. ruspolii*? Des hybrides entre ces deux espèces ont été photographiés en 2001 dans la zone de contact de leurs distributions géographiques. La progression depuis une cinquantaine d'années de nos connaissances sur *T. ruspolii* et sur son rapport avec *T. leucotis* est présentée. L'hybridation est très probablement un phénomène récent, engendré par une dégradation des habitats due au développement des activités agricoles. Cette transformation du milieu naturel rompt l'isolement reproducteur entre les deux espèces qui ne semble assuré que par une barrière écologique. La menace que représente l'hybridation pour la conservation de *T. ruspolii* est discutée. Les ornithologues visitant l'Éthiopie sont invités à participer par leurs observations à une meilleure compréhension du problème.

Photographs of Prince Ruspoli's Turaco *Tauraco ruspolii* taken by RS in southern Ethiopia in February 2001, at a site where this species and White-cheeked Turaco *T. leucotis* are in contact, proved that at least four birds were hybrids between the two species. This is apparently the first documented case of hybridisation between turacos in the wild (Lernould & Seitre 2002).

This discovery raises two questions: (1) is hybridisation between these species a recent event or does a natural hybridisation zone exist that has escaped the attention of observers until now?, and (2) what are the consequences of this finding for the conservation of Prince Ruspoli's Turaco?

Conservation status of *T. ruspolii*

Moreau (1958) considered *T. ruspolii* a relict species related to *T. leucotis*, and confined to a single locality, although he admitted that it could occur elsewhere in the zoologically largely unexplored south-eastern Ethiopian highlands. He believed that its peculiarities are such that it was probably reproductively isolated. However, he considered it also possible that *ruspolii*, if allopatric with either of the two subspecies of *leucotis*, could be conspecific with the latter species. Moreau also expressed the hypothesis that the isolation of *T. ruspolii* in a small region could be a consequence of pressure due to the expansion of *T. leucotis* in response to past climatic changes.

In 1968, Erard & Prévost (1970, 1971) discovered *T. ruspolii* near Wadera, a town c.120 km

north-northeast of Arero, the only locality from where the species was then known. They noticed that it was sympatric with *T. l. leucotis* but that the two species occurred in different habitats. This proved that *T. ruspolii*'s range was larger than previously thought and that it was not conspecific with *T. leucotis*.

Collar & Stuart (1985) stated that, although records in 1968–73 established that the species was commoner than previous evidence had suggested, information was still too scant to allow confidence concerning its overall abundance. They considered that the species was at risk through habitat alteration linked to possible resettlement schemes. They also followed Moreau (1958) and Erard & Prévost (1970) in thinking that the species was apparently relict and had suffered in competition with *T. leucotis*. They finally remarked that, where the two species are sympatric, *T. ruspolii* may very gradually be in decline and will ultimately become extinct from natural causes. According to the IUCN Red Data Book categories of threat of that time, they classified *T. ruspolii* as Rare: taxon with small world population that is not at present Endangered or Vulnerable, but at risk (because of range restriction in this case). In 1994, following changes in the IUCN criteria, *T. ruspolii* was reclassified as Endangered (Collar *et al.* 1994). As field work subsequently found the species to be more common and widespread than previously thought (Borghesio 1997a,b), it has been down-listed to Vulnerable (BirdLife 2000, 2004).

Borghesio's (1997a,b) long and detailed field work in 1995 brought new data about *T. ruspolii* and its relation with *T. leucotis*. His conclusions can be summarised as follows. The two Ethiopian turacos are largely separated by habitat in areas where they are in contact. They replace each other with little or no overlap. Since their habitat overlap is restricted, the hypothesis of a strong interaction between the two species no longer seems valid. This is reinforced by the fact that, in sympatry, *T. leucotis* occupies a more restricted range of habitats than it does in allopatry. Therefore, competition is not likely to be a severe threat for *T. ruspolii*, which seems to be better adapted than its relative to its non-forest habitat. Prince Ruspoli's Turaco should not be considered a gradually disappearing relict as was supposed by former authors. The preferred habitats of *T. ruspolii*, owing to their dryness, are subject to much lower pressure from human populations than higher and more humid habitats. Consequently, Borghesio suggested that *T. ruspolii*'s conservation status was probably less severe than previously thought.

Possible cause of hybridisation

Following our discovery of hybrids (Lernould & Seitre 2002), Borghesio decided to visit the range of *T. ruspolii* again in order to reassess its conservation status (Borghesio *et al.* 2004). During this survey, one hybrid was observed in an area 30 km west of the locality where the photos were taken. Considering that Borghesio observed a large number of turacos of both species but did not notice any hybrids during his almost 2.5 months in the field in 1995 (although he admits he could have missed them), and that his team searched specifically for hybrids during the 2003 survey but found only one, we suppose that hybridisation is a recent phenomenon and that there is no natural hybrid zone where the two turacos came into contact.

In Gabon, Green Turaco *T. persa* and Yellow-billed Turaco *T. macrorhynchus* coexist through habitat separation and strong interspecific territorial exclusion where they come into contact (Decoux & Erard 1988). In the same paper, Erard mentioned also having observed aggressive behaviour between *T. leucotis* and *T. ruspolii*. Observations in aviaries confirm the strong intra- and interspecific territoriality of turacos, but also demonstrate that hybrids can easily result and, in one case that we know, are fertile (Lernould &

Seitre 2002). In fact, turacos of the Musophaginae not only share the typical and striking red flight feathers but they have also a very homogenous social behaviour (JML pers. obs.). Therefore, we suppose that the reproductive isolation between sympatric Musophaginae species is achieved by ecological barriers rather than by genetic or behavioural barriers.

Borghesio *et al.* (2004) made two most important observations in 2003. They noticed that, since 1995, White-cheeked Turaco had apparently expanded its range into that of Prince Ruspoli's by occupying cultivated areas and exotic trees plantations in the Kibre Mengist area, and that groups comprising both species could now be observed. Their conclusions confirmed ours (Lernould & Seitre 2002): that habitat changes have probably deteriorated the ecological barrier between the two species, thereby increasing the likelihood of hybridisation and competition.

Discussion

Moreau (1958) considered that White-cheeked and Prince Ruspoli's Turacos have a common ancestor, grouping them with Hartlaub's Turaco *T. hartlaubi* in a superspecies. Erard & Prévost (1971) expressed the same opinion. However, the phylogenetic study by Véron (1999) of the turacos, based on an analysis of morphological characters, does not support this hypothesis: *T. ruspolii* represents a much earlier branch than *T. leucotis*, with a number of species separating them. Although the Ethiopian turacos appear identical in general coloration, this is probably not a significant character in considering their inter-relatedness, as e.g. *T. persa* and *T. macrorhynchus* also have similar body coloration. Head patterns are clearly a better indication of the degree of relatedness between species of turacos and it is evident, in this respect, that *T. ruspolii* and *T. leucotis* are not close to each other, having no head ornamentation in common.

It is unfortunate that the genetic study of Véron & Winney (2000) did not include *T. ruspolii*. Among their findings, it initially appears strange that *T. hartlaubi* should fall within the *T. persa* superspecies, an association that has not been suggested previously. However, although *hartlaubi* has a different type of crest, it shares the white spot and line with all species of the *persa* group. Is it this proximity of *T. hartlaubi* to *T. persa* that



Figures 1–2. Hybrid Prince Ruspoli's *Tauraco ruspolii* x White-cheeked Turaco *T. leucotis* (Roland Seitre)
 Hybride entre le Touraco du Prince Ruspoli *Tauraco ruspolii* et le Touraco à joues blanches *T. leucotis* (Roland Seitre)
 Figure 3. White-cheeked Turaco / Touraco à joues blanches *Tauraco leucotis* (Jean-Marc Lernoould)
 Figures 4–9. Prince Ruspoli's Turaco / Touraco du Prince Ruspoli *Tauraco ruspolii* (Jean-Marc Lernoould)



explains the existence of fertile hybrids, born in aviary, between them? Can we expect hybrids between *T. ruspolii* and *T. leucotis* to be sterile if these species are genetically sufficiently different? It is currently impossible to answer such questions, unless birds are captured for experimental breeding or a successful nest with at least one hybrid parent is found. The threat of hybridisation is much more complicated to tackle than hunting or habitat destruction, and could pose a real challenge for the conservation of Prince Ruspoli's Turaco.

Conclusion

It is probably too early to discuss the conservation issue further, as more information concerning the extent of hybridisation is required. A prolonged field study is needed to estimate the extent of the problem. However, birdwatchers visiting Ethiopia can contribute by paying special attention to the turacos they observe in the contact zone and providing detailed information concerning any observed hybrids. As is evident from the photos (probably of first-generation cross), hybrids are truly intermediate between the parent species and are easily identified.

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